

SEQUENCE LISTING

<110> DRUILHE, PIERRE
DAUBERSIES, PIERRE

<120> MALARIAL PRE-ERYTHROCYTIC STAGE POLYPEPTIDE MOLECULES

<130> 0660-0125-0 PCT

<140> 08/973,462

<141> 1998-02-06

<150> PCT/FR96/00894

<151> 1996-06-12

<150> FR 95/07007

<151> 1995-06-13

<160> 29

<170> PatentIn Ver. 2.0

<210> 1

<211> 6152

<212> DNA

<213> P. falciparum

<400> 1

atttttttat ttttattggt ttatttcttt tttttcttta aattgtatat ttataaatat 60
tttaaaaagt tagaaaatga caaatagtaa ttacaaatca aataataaaa catataatga 120
aaataataat gaacaaataa ctaccatatt taatagaaca aatatgaatc cgataaaaaa 180
atgtcatatg agagaaaaaa taaataagta cttttttttg atcaaaattt tgacatgcac 240
cattttaata tgggctgtac aatatgataa taacgtaaga taaaaaacta aataataaat 300
ataaataaaa aaaaaaaaaa aaaaaaaaaa atcaactata tagtatgtat aatatatata 360
tatatatata tatatatata tatatatata tattttatttt tattttattta ttaatttttt 420
tttttttata ttatcttttt agtctgatat aaacaagagt tggaaaaaaa atacgtatgt 480
agataagaaa ttgaataaac tattttaacag aagtttagga gaatctcaag taaatgggtga 540
attagctagt gaagaagtaa aggaaaaaat tcttgactta ttagaagaag gaaatacatt 600

aactgaaagt gtagatgata ataaaaattt agaagaagcc gaagatataa aggaaaatat 660
cttattaagt aatatagaag aacccaaaaga aaatattatt gacaatttat taaataatat 720
tggacaaaat tcagaaaaaac aagaaagtgt atcagaaaat gtacaagtca gtgatgaact 780
ttttaatgaa ttattaaata gtgtagatgt taatggagaa gtaaaagaaa atatttttga 840
ggaaagtcaa gttaatgacg atatttttaa tagtttagta aaaagtgttc aacaagaaca 900
acaacacaat gttgaagaaa aagttgaaga aagtgtagaa gaaaatgacg aagaaagtgt 960
agaagaaaat gtagaagaaa atgtagaaga aaatgacgac ggaagtgtag cctcaagtgt 1020
tgaagaaagt atagcttcaa gtggtgatga aagtatagat tcaagtattg aagaaaatgt 1080
agctccaact gttgaagaaa tcgtagctcc aagtgttgta gaaagtgtgg ctccaagtgt 1140
tgaagaaagt gtagaagaaa atggtgaaga aagtgtagct gaaaatgttg aagaaagtgt 1200
agctgaaaat gttgaagaaa gtgtagctga aaatgttgaa gaaagtgtag ctgaaaatgt 1260
tgaagaaatc gtagctccaa ctggtgaaga aatcgtagct ccaactgttg aagaaattgt 1320
agctccaagt gttgtagaaa gtgtggctcc aagtgttgaa gaaagtgtag aagaaaatgt 1380
tgaagaaagt gtagctgaaa atggtgaaga aagtgtagct gaaaatgttg aagaaagtgt 1440
agctgaaaat gttgaagaaa gtgtagctga aaatgttgaa gaaagtgtag ctgaaaatgt 1500
tgaagaaatc gtagctccaa ctggtgaaga aatcgtagct ccaactgttg aagaaattgt 1560
agctccaagt gttgtagaaa gtgtggctcc aagtgttgaa gaaagtgtag aagaaaatgt 1620
tgaagaaagt gtagctgaaa atggtgaaga aagtgtagct gaaaatgttg aagaaagtgt 1680
agctgaaaat gttgaagaaa gtgtagctga aaatgttgaa gaaagtgtag ctgaaaatgt 1740
tgaagaaagt gtagctgaaa atggtgaaga aagtgtagct gaaaatgttg aagaaatcgt 1800
agctccaact gttgaagaaa tcgtagctcc aactgttgaa gaaattgtag ctccaagtgt 1860
tgtagaaagt gtggctccaa gtggtgaaga aagtgtagaa gaaaatgttg aagaaagtgt 1920
agctgaaaat gttgaagaaa gtgtagctga aaatgttgaa gaaagtgtag ctgaaaatgt 1980
tgaagaaagt gtagctgaaa atggtgaaga aatcgtagct ccaactgttg aagaaatcgt 2040
agctccaact gttgaagaaa ttgtagctcc aagtgttgta gaaagtgtgg ctccaagtgt 2100

tgaagaaagt gtagaagaaa atggtgaaga aagtgtagct gaaaatggtg aagaaagtgt 2160
 agctgaaaat gttgaagaaa gtgtagctga aaatggtgaa gaaatcgtag ctccaactgt 2220
 tgaagaaatc gtagctccaa ctggtgaaga aattgtagct ccaagtgttg tagaaagtgt 2280
 ggctccaagt gttgaagaaa gtgtagaaga aaatggtgaa gaaagtgtag ctgaaaatgt 2340
 tgaagaaagt gtagctgaaa atggtgaaga aagtgtagct gaaaatggtg aagaaagtgt 2400
 agctgaaaat gttgaagaaa tcgtagctcc aactggtgaa gaaatcgtag ctccaactgt 2460
 tgaagaaatt gtagctccaa gtggtgtaga aagtgtggct ccaagtgttg aagaaagtgt 2520
 agaagaaaat gttgaagaaa gtgtagctga aaatggtgaa gaaagtgtag ctgaaaatgt 2580
 tgaagaaagt gtagctgaaa atggtgaaga aagtgtagct ccaactgttg aagaaattgt 2640
 agctccaagt gttgaagaaa gtgtagctcc aagtgttgaa gaaagtgttg ctgaaaacgt 2700
 tgcaagaaat ttatcagaca atcttttaag taatttatta ggtggtatcg aaactgagga 2760
 aataaaggac agtatattaa atgagataga agaagtaaaa gaaaatgtag tcaccacaat 2820
 actagaaaac gtagaagaaa ctacagctga aagtgttaact acttttagta acatattaga 2880
 ggagatacaa gaaaatacta ttactaatga tactatagag gaaaaattag aagaactcca 2940
 cgaaaatgta ttaagtgccg ctttagaaaa tacccaaagt gaagaggaaa agaaagaagt 3000
 aatagatgta attgaagaag taaaagaaga ggtcgctacc actttaatag aaactgtgga 3060
 acaggcagaa gaaaagagcg caaatacaat tacggaaata tttgaaaatt tagaagaaaa 3120
 tgcagtagaa agtaatgaaa atggtgcaga gaatttagag aaattaaacg aaactgtatt 3180
 taatactgta ttagataaag tagaggaaac agtagaaatt agcggagaaa gtttagaaaa 3240
 caatgaaatg gataaagcat tttttagtga aatatttgat aatgtaaaag gaatacaaga 3300
 aaatttatta acaggtatgt ttcgaagtat agaaaccagt atagtaatcc aatcagaaga 3360
 aaaggttgat ttgaatgaaa atgtgggttag ttcgatttta gataatatag aaaatatgaa 3420
 agaaggttta ttaaataaat tagaaaatat ttcaagtact gaagggtgtc aagaaactgt 3480
 aactgaacat gtagaacaaa atgtatatgt ggatgttgat gttcctgcta tgaaagatca 3540
 atttttagga atattaaatg aggcaggagg gttgaaagaa atgtttttta atttggaaga 3600

tgtattttaa agtgaaagt atgtaattac tgtagaagaa attaaggatg aaccgggttca 3660
 aaaagaggta gaaaaagaaa ctgtagtat tattgaagaa atggaagaaa atattgtaga 3720
 tgtattagag gaagaaaaag aagatttaac agacaagatg atagatgcag tagaagaatc 3780
 catagaaata tcttcagatt ctaaagaaga aactgaatct attaaagata aagaaaaaga 3840
 tgtttcacta gttgttgaag aagttcaaga caatgatatg gatgaaagtg ttgagaaagt 3900
 tttagaattg aaaaatatgg aagaggagtt aatgaaggat gctgttgaaa taaatgacat 3960
 tactagcaaa cttattgaag aaactcaaga gttaaataaa gtagaagcag atttaataaa 4020
 agatatggaa aaattaaaag aattagaaaa agcattatca gaagattcta aagaaataat 4080
 agatgcaaaa gatgatacat tagaaaaagt tattgaagag gaacatgata taacgacgac 4140
 gttggatgaa gttgtagaat taaaagatgt cgaagaagac aagatcgaaa aagtatctga 4200
 tttaaaagat cttgaagaag atatattaaa agaagtaaaa gaaatcaaag aacttgaaag 4260
 tgaaatttta gaagattata aagaattaaa aactattgaa acagatattt tagaagagaa 4320
 aaaagaata gaaaaagatc attttgaaaa attcgaagaa gaagctgaag aaataaaaaga 4380
 tcttgaagca gatatattaa aagaagtatc ttcattagaa gttgaagaag aaaaaaatt 4440
 agaagaagta cacgaattaa aagaagaggt agaacatata ataagtgggtg atgcgcatat 4500
 aaaagggttg gaagaagatg atttagaaga agtagatgat ttaaaaggaa gtatattaga 4560
 catgtttaaag ggagatatgg aattagggga tatggataag gaaagtttag aagatgtaac 4620
 aacaaaactt ggagaaagag ttgaatcctt aaaagatgtt ttatctagtg cattagggcat 4680
 ggatgaagaa caaatgaaaa caagaaaaaa agctcaaaga cctaagttgg aagaagtatt 4740
 attaaaagaa gaggttaaag aagaaccaa gaaaaaata acaaaaaaga aagtaagggtt 4800
 tgatattaag gataaggaac caaaagatga aatagtagaa gttgaaatga aagatgaaga 4860
 tatagaagaa gatgtagaag aagatataga agaagatata gaagaagata aagttgaaga 4920
 tatagatgaa gatatagatg aagatatagg tgaagacaaa gatgaagtta tagatttaat 4980
 agtccaaaaa gagaaacgca ttgaaaaggt taaagcgaaa aagaaaaaat tagaaaaaaa 5040
 agttgaagaa ggtgttagtg gtcttaaaaa acacgtagac gaagtaatga aatatgttca 5100

aaaaattgat aaagaagttg ataaagaagt atctaaagct ttagaatcaa aaaatgatgt 5160
 tactaatgtt ttaaaacaaa atcaagattt ttttagtaaa gttaaaaact tcgtaaaaaa 5220
 atataaagta tttgctgcac cattcatatc tgccgttgca gcatttgcac catatgtagt 5280
 tgggttcttt acattttctt tattttcatc atgtgtaaca atagcttctt caacttactt 5340
 attatcaaaa gttgacaaaa ctataaataa aaataaggag agaccgtttt attcatttgt 5400
 atttgatatc ttttaagaatt taaaacatta tttacaacaa atgaaagaaa aatttagtaa 5460
 agaaaaaat aataatgtaa tagaagtaac aaacaaagct gagaaaaaag gtaatgtaca 5520
 ggtaacaaat aaaaccgaga aaacaactaa agttgataaa aataataaag taccgaaaaa 5580
 aagaagaacg caaaaatcaa aataaaaaat tgcagaagag tgaaatgatt ggagcgaaca 5640
 ataaaattaa tcgataaaaa atataaaaaat gtatatatta tgtaaataata tataaataaa 5700
 taaataaata catacatata tatatatata tatatgtatc tttttacaaa attttaaaat 5760
 tttaaaattt atatatatta atatttatat ttttccatat ataattttat tttcaatatt 5820
 ttatttttaa ttataaatgt tttttacaga gtttatgttt ttttaattaat atatagattt 5880
 ctgtgaagaaa ctgtatatta ttcatacgat atatgtaata ttaattattt gtgttttatt 5940
 aaaatttata ttatataata tatatatata tatatatgta tatatattag aagataaaaa 6000
 tttagcttat tttgcttggt atgcaaataa gctttttttt tttttttttt tttttttttc 6060
 atataaacga tgtttaattt ttaattttta atattttata taaaatattt ttcctaaaaa 6120
 aaaaaaaaat taaaaaaaac ttatatttcg aa 6152

<210> 2
 <211> 5361
 <212> DNA
 <213> P. falciparum

<220>
 <221> CDS
 <222> (1)..(5361)

<400> 2
 atg aca aat agt aat tac aaa tca aat aat aaa aca tat aat gaa aat 48
 Met Thr Asn Ser Asn Tyr Lys Ser Asn Asn Lys Thr Tyr Asn Glu Asn

1	5	10	15			
aat aat gaa caa ata act acc ata ttt aat aga aca aat atg aat ccg	Asn Asn Glu Gln Ile Thr Thr Ile Phe Asn Arg Thr Asn Met Asn Pro	20	25	30	96	
ata aaa aaa tgt cat atg aga gaa aaa ata aat aag tac ttt ttt ttg	Ile Lys Lys Cys His Met Arg Glu Lys Ile Asn Lys Tyr Phe Phe Leu	35	40	45	144	
atc aaa att ttg aca tgc acc att tta ata tgg gct gta caa tat gat	Ile Lys Ile Leu Thr Cys Thr Ile Leu Ile Trp Ala Val Gln Tyr Asp	50	55	60	192	
aat aac tct gat ata aac aag agt tgg aaa aaa aat acg tat gta gat	Asn Asn Ser Asp Ile Asn Lys Ser Trp Lys Lys Asn Thr Tyr Val Asp	65	70	75	80	240
aag aaa ttg aat aaa cta ttt aac aga agt tta gga gaa tct caa gta	Lys Lys Leu Asn Lys Leu Phe Asn Arg Ser Leu Gly Glu Ser Gln Val	85	90	95	288	
aat ggt gaa tta gct agt gaa gaa gta aag gaa aaa att ctt gac tta	Asn Gly Glu Leu Ala Ser Glu Glu Val Lys Glu Lys Ile Leu Asp Leu	100	105	110	336	
tta gaa gaa gga aat aca tta act gaa agt gta gat gat aat aaa aat	Leu Glu Glu Gly Asn Thr Leu Thr Glu Ser Val Asp Asp Asn Lys Asn	115	120	125	384	
tta gaa gaa gcc gaa gat ata aag gaa aat atc tta tta agt aat ata	Leu Glu Glu Ala Glu Asp Ile Lys Glu Asn Ile Leu Leu Ser Asn Ile	130	135	140	432	
gaa gaa cca aaa gaa aat att att gac aat tta tta aat aat att gga	Glu Glu Pro Lys Glu Asn Ile Ile Asp Asn Leu Leu Asn Asn Ile Gly	145	150	155	160	480
caa aat tca gaa aaa caa gaa agt gta tca gaa aat gta caa gtc agt	Gln Asn Ser Glu Lys Gln Glu Ser Val Ser Glu Asn Val Gln Val Ser	165	170	175	528	
gat gaa ctt ttt aat gaa tta tta aat agt gta gat gtt aat gga gaa	Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly Glu	180	185	190	576	
gta aaa gaa aat att ttg gag gaa agt caa gtt aat gac gat att ttt	Val Lys Glu Asn Ile Leu Glu Glu Ser Gln Val Asn Asp Asp Ile Phe	195	200	205	624	

aat agt tta gta aaa agt gtt caa caa gaa caa caa cac aat gtt gaa	672
Asn Ser Leu Val Lys Ser Val Gln Gln Glu Gln Gln His Asn Val Glu	
210 215 220	
gaa aaa gtt gaa gaa agt gta gaa gaa aat gac gaa gaa agt gta gaa	720
Glu Lys Val Glu Glu Ser Val Glu Glu Asn Asp Glu Glu Ser Val Glu	
225 230 235 240	
gaa aat gta gaa gaa aat gta gaa gaa aat gac gac gga agt gta gcc	768
Glu Asn Val Glu Glu Asn Val Glu Glu Asn Asp Asp Gly Ser Val Ala	
245 250 255	
tca agt gtt gaa gaa agt ata gct tca agt gtt gat gaa agt ata gat	816
Ser Ser Val Glu Glu Ser Ile Ala Ser Ser Val Asp Glu Ser Ile Asp	
260 265 270	
tca agt att gaa gaa aat gta gct cca act gtt gaa gaa atc gta gct	864
Ser Ser Ile Glu Glu Asn Val Ala Pro Thr Val Glu Glu Ile Val Ala	
275 280 285	
cca agt gtt gta gaa agt gtg gct cca agt gtt gaa gaa agt gta gaa	912
Pro Ser Val Val Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val Glu	
290 295 300	
gaa aat gtt gaa gaa agt gta gct gaa aat gtt gaa gaa agt gta gct	960
Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala	
305 310 315 320	
gaa aat gtt gaa gaa agt gta gct gaa aat gtt gaa gaa agt gta gct	1008
Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala	
325 330 335	
gaa aat gtt gaa gaa atc gta gct cca act gtt gaa gaa atc gta gct	1056
Glu Asn Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile Val Ala	
340 345 350	
cca act gtt gaa gaa att gta gct cca agt gtt gta gaa agt gtg gct	1104
Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Ser Val Ala	
355 360 365	
cca agt gtt gaa gaa agt gta gaa gaa aat gtt gaa gaa agt gta gct	1152
Pro Ser Val Glu Glu Ser Val Glu Glu Asn Val Glu Glu Ser Val Ala	
370 375 380	
gaa aat gtt gaa gaa agt gta gct gaa aat gtt gaa gaa agt gta gct	1200
Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala	
385 390 395 400	
gaa aat gtt gaa gaa agt gta gct gaa aat gtt gaa gaa agt gta gct	1248

Glu Asn Val	Glu Glu Ser Val	Ala Glu Asn Val	Glu Glu Ser Val	Ala													
	405		410														
gaa aat gtt	gaa gaa atc	gta gct cca	act gtt gaa	gaa atc gta	gct												1296
Glu Asn Val	Glu Glu Ile Val	Ala Pro Thr Val	Glu Glu Ile Val	Ala													
	420		425														
cca act gtt	gaa gaa att	gta gct cca	agt gtt gta	gaa agt gtg	gct												1344
Pro Thr Val	Glu Glu Ile Val	Ala Pro Ser Val	Val Val Glu Ser	Val Ala													
	435		440														
cca agt gtt	gaa gaa agt	gta gaa gaa	aat gtt gaa	gaa agt gta	gct												1392
Pro Ser Val	Glu Glu Ser Val	Glu Glu Asn Val	Glu Glu Ser Val	Ala													
	450		455														
gaa aat gtt	gaa gaa agt	gta gct gaa	aat gtt gaa	gaa agt gta	gct												1440
Glu Asn Val	Glu Glu Ser Val	Ala Glu Asn Val	Glu Glu Ser Val	Ala													
	465		470														
gaa aat gtt	gaa gaa agt	gta gct gaa	aat gtt gaa	gaa agt gta	gct												1488
Glu Asn Val	Glu Glu Ser Val	Ala Glu Asn Val	Glu Glu Ser Val	Ala													
	485		490														
gaa aat gtt	gaa gaa agt	gta gct gaa	aat gtt gaa	gaa agt gta	gct												1536
Glu Asn Val	Glu Glu Ser Val	Ala Glu Asn Val	Glu Glu Ser Val	Ala													
	500		505														
gaa aat gtt	gaa gaa atc	gta gct cca	act gtt gaa	gaa atc gta	gct												1584
Glu Asn Val	Glu Glu Ile Val	Ala Pro Thr Val	Glu Glu Ile Val	Ala													
	515		520														
cca act gtt	gaa gaa att	gta gct cca	agt gtt gta	gaa agt gtg	gct												1632
Pro Thr Val	Glu Glu Ile Val	Ala Pro Ser Val	Val Val Glu Ser	Val Ala													
	530		535														
cca agt gtt	gaa gaa agt	gta gaa gaa	aat gtt gaa	gaa agt gta	gct												1680
Pro Ser Val	Glu Glu Ser Val	Glu Glu Asn Val	Glu Glu Ser Val	Ala													
	545		550														
gaa aat gtt	gaa gaa agt	gta gct gaa	aat gtt gaa	gaa agt gta	gct												1728
Glu Asn Val	Glu Glu Ser Val	Ala Glu Asn Val	Glu Glu Ser Val	Ala													
	565		570														
gaa aat gtt	gaa gaa agt	gta gct gaa	aat gtt gaa	gaa atc gta	gct												1776
Glu Asn Val	Glu Glu Ser Val	Ala Glu Asn Val	Glu Glu Ser Val	Ala													
	580		585														
cca act gtt	gaa gaa atc	gta gct cca	act gtt gaa	gaa att gta	gct												1824
Pro Thr Val	Glu Glu Ile Val	Ala Pro Thr Val	Glu Glu Ile Val	Ala													

595

600

605

cca	agt	gtt	gta	gaa	agt	gtg	gct	cca	agt	gtt	gaa	gaa	agt	gta	gaa	1872
Pro	Ser	Val	Val	Glu	Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	Val	Glu	
610				615				620								

gaa	aat	gtt	gaa	gaa	agt	gta	gct	gaa	aat	gtt	gaa	gaa	agt	gta	gct	1920
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	
625				630				635				640				

gaa	aat	gtt	gaa	gaa	agt	gta	gct	gaa	aat	gtt	gaa	gaa	atc	gta	gct	1968
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ile	Val	Ala	
645				650				655								

cca	act	gtt	gaa	gaa	atc	gta	gct	cca	act	gtt	gaa	gaa	att	gta	gct	2016
Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	
660				665				670								

cca	agt	gtt	gta	gaa	agt	gtg	gct	cca	agt	gtt	gaa	gaa	agt	gta	gaa	2064
Pro	Ser	Val	Val	Glu	Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	Val	Glu	
675				680				685								

gaa	aat	gtt	gaa	gaa	agt	gta	gct	gaa	aat	gtt	gaa	gaa	agt	gta	gct	2112
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	
690				695				700								

gaa	aat	gtt	gaa	gaa	agt	gta	gct	gaa	aat	gtt	gaa	gaa	agt	gta	gct	2160
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	
705				710				715				720				

gaa	aat	gtt	gaa	gaa	atc	gta	gct	cca	act	gtt	gaa	gaa	atc	gta	gct	2208
Glu	Asn	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	
725				730				735								

cca	act	gtt	gaa	gaa	att	gta	gct	cca	agt	gtt	gta	gaa	agt	gtg	gct	2256
Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	Pro	Ser	Val	Val	Glu	Ser	Val	Ala	
740				745				750								

cca	agt	gtt	gaa	gaa	agt	gta	gaa	gaa	aat	gtt	gaa	gaa	agt	gta	gct	2304
Pro	Ser	Val	Glu	Glu	Ser	Val	Glu	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	
755				760				765								

gaa	aat	gtt	gaa	gaa	agt	gta	gct	gaa	aat	gtt	gaa	gaa	agt	gta	gct	2352
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	
770				775				780								

gaa	aat	gtt	gaa	gaa	agt	gta	gct	cca	act	gtt	gaa	gaa	att	gta	gct	2400
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	
785				790				795				800				

cca agt gtt gaa gaa agt gta gct cca agt gtt gaa gaa agt gtt gct	2448
Pro Ser Val Glu Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val Ala	
805 810 815	
gaa aac gtt gca aca aat tta tca gac aat ctt tta agt aat tta tta	2496
Glu Asn Val Ala Thr Asn Leu Ser Asp Asn Leu Leu Ser Asn Leu Leu	
820 825 830	
ggg ggt atc gaa act gag gaa ata aag gac agt ata tta aat gag ata	2544
Gly Gly Ile Glu Thr Glu Glu Ile Lys Asp Ser Ile Leu Asn Glu Ile	
835 840 845	
gaa gaa gta aaa gaa aat gta gtc acc aca ata cta gaa aac gta gaa	2592
Glu Glu Val Lys Glu Asn Val Val Thr Thr Ile Leu Glu Asn Val Glu	
850 855 860	
gaa act aca gct gaa agt gta act act ttt agt aac ata tta gag gag	2640
Glu Thr Thr Ala Glu Ser Val Thr Thr Phe Ser Asn Ile Leu Glu Glu	
865 870 875 880	
ata gaa gaa aat act att act aat gat act ata gag gaa aaa tta gaa	2688
Ile Gln Glu Asn Thr Ile Thr Asn Asp Thr Ile Glu Glu Lys Leu Glu	
885 890 895	
gaa gtc cac gaa aat gta tta agt gcc gct tta gaa aat acc caa agt	2736
Glu Leu His Glu Asn Val Leu Ser Ala Ala Leu Glu Asn Thr Gln Ser	
900 905 910	
gaa gag gaa aag aaa gaa gta ata gat gta att gaa gaa gta aaa gaa	2784
Glu Glu Glu Lys Lys Glu Val Ile Asp Val Ile Glu Glu Val Lys Glu	
915 920 925	
gag gtc gct acc act tta ata gaa act gtg gaa cag gca gaa gaa aag	2832
Glu Val Ala Thr Thr Leu Ile Glu Thr Val Glu Gln Ala Glu Glu Lys	
930 935 940	
agc gca aat aca att acg gaa ata ttt gaa aat tta gaa gaa aat gca	2880
Ser Ala Asn Thr Ile Thr Glu Ile Phe Glu Asn Leu Glu Glu Asn Ala	
945 950 955 960	
gta gaa agt aat gaa aat gtt gca gag aat tta gag aaa tta aac gaa	2928
Val Glu Ser Asn Glu Asn Val Ala Glu Asn Leu Glu Lys Leu Asn Glu	
965 970 975	
act gta ttt aat act gta tta gat aaa gta gag gaa aca gta gaa att	2976
Thr Val Phe Asn Thr Val Leu Asp Lys Val Glu Glu Thr Val Glu Ile	
980 985 990	
agc gga gaa agt tta gaa aac aat gaa atg gat aaa gca ttt ttt agt	3024

Ser	Gly	Glu	Ser	Leu	Glu	Asn	Asn	Glu	Met	Asp	Lys	Ala	Phe	Phe	Ser		
	995						1000					1005					
gaa	ata	ttt	gat	aat	gta	aaa	gga	ata	caa	gaa	aat	tta	tta	aca	ggt	3072	
Glu	Ile	Phe	Asp	Asn	Val	Lys	Gly	Ile	Gln	Glu	Asn	Leu	Leu	Thr	Gly		
	1010					1015					1020						
atg	ttt	cga	agt	ata	gaa	acc	agt	ata	gta	atc	caa	tca	gaa	gaa	aag	3120	
Met	Phe	Arg	Ser	Ile	Glu	Thr	Ser	Ile	Val	Ile	Gln	Ser	Glu	Glu	Lys		
	1025				1030					1035					1040		
gtt	gat	ttg	aat	gaa	aat	gtg	gtt	agt	tcg	att	tta	gat	aat	ata	gaa	3168	
Val	Asp	Leu	Asn	Glu	Asn	Val	Val	Ser	Ser	Ile	Leu	Asp	Asn	Ile	Glu		
				1045					1050						1055		
aat	atg	aaa	gaa	ggt	tta	tta	aat	aaa	tta	gaa	aat	att	tca	agt	act	3216	
Asn	Met	Lys	Glu	Gly	Leu	Leu	Asn	Lys	Leu	Glu	Asn	Ile	Ser	Ser	Thr		
		1060						1065					1070				
gaa	ggt	gtt	caa	gaa	act	gta	act	gaa	cat	gta	gaa	caa	aat	gta	tat	3264	
Glu	Gly	Val	Gln	Glu	Thr	Val	Thr	Glu	His	Val	Glu	Gln	Asn	Val	Tyr		
		1075					1080					1085					
gtg	gat	gtt	gat	gtt	cct	gct	atg	aaa	gat	caa	ttt	tta	gga	ata	tta	3312	
Val	Asp	Val	Asp	Val	Pro	Ala	Met	Lys	Asp	Gln	Phe	Leu	Gly	Ile	Leu		
	1090					1095					1100						
aat	gag	gca	gga	ggg	ttg	aaa	gaa	atg	ttt	ttt	aat	ttg	gaa	gat	gta	3360	
Asn	Glu	Ala	Gly	Gly	Leu	Lys	Glu	Met	Phe	Phe	Asn	Leu	Glu	Asp	Val		
	1105				1110					1115					1120		
ttt	aaa	agt	gaa	agt	gat	gta	att	act	gta	gaa	gaa	att	aag	gat	gaa	3408	
Phe	Lys	Ser	Glu	Ser	Asp	Val	Ile	Thr	Val	Glu	Glu	Ile	Lys	Asp	Glu		
				1125					1130					1135			
ccg	gtt	caa	aaa	gag	gta	gaa	aaa	gaa	act	gtt	agt	att	att	gaa	gaa	3456	
Pro	Val	Gln	Lys	Glu	Val	Glu	Lys	Glu	Thr	Val	Ser	Ile	Ile	Glu	Glu		
			1140					1145					1150				
atg	gaa	gaa	aat	att	gta	gat	gta	tta	gag	gaa	gaa	aaa	gaa	gat	tta	3504	
Met	Glu	Glu	Asn	Ile	Val	Asp	Val	Leu	Glu	Glu	Glu	Lys	Glu	Asp	Leu		
	1155						1160						1165				
aca	gac	aag	atg	ata	gat	gca	gta	gaa	gaa	tcc	ata	gaa	ata	tct	tca	3552	
Thr	Asp	Lys	Met	Ile	Asp	Ala	Val	Glu	Glu	Ser	Ile	Glu	Ile	Ser	Ser		
	1170					1175					1180						
gat	tct	aaa	gaa	gaa	act	gaa	tct	att	aaa	gat	aaa	gaa	aaa	gat	gtt	3600	
Asp	Ser	Lys	Glu	Glu	Thr	Glu	Ser	Ile	Lys	Asp	Lys	Glu	Lys	Asp	Val		

1185	1190	1195	1200	
tca cta gtt gtt gaa gaa gtt caa gac aat gat atg gat gaa agt gtt				3648
Ser Leu Val Val Glu Glu Val Gln Asp Asn Asp Met Asp Glu Ser Val				
1205		1210	1215	
gag aaa gtt tta gaa ttg aaa aat atg gaa gag gag tta atg aag gat				3696
Glu Lys Val Leu Glu Leu Lys Asn Met Glu Glu Glu Leu Met Lys Asp				
1220		1225	1230	
gct gtt gaa ata aat gac att act agc aaa ctt att gaa gaa act caa				3744
Ala Val Glu Ile Asn Asp Ile Thr Ser Lys Leu Ile Glu Glu Thr Gln				
1235		1240	1245	
gag tta aat gaa gta gaa gca gat tta ata aaa gat atg gaa aaa tta				3792
Glu Leu Asn Glu Val Glu Ala Asp Leu Ile Lys Asp Met Glu Lys Leu				
1250		1255	1260	
aaa gaa tta gaa aaa gca tta tca gaa gat tct aaa gaa ata ata gat				3840
Lys Glu Leu Glu Lys Ala Leu Ser Glu Asp Ser Lys Glu Ile Ile Asp				
1265		1270	1275	1280
gca aaa gat gat aca tta gaa aaa gtt att gaa gag gaa cat gat ata				3888
Ala Lys Asp Asp Thr Leu Glu Lys Val Ile Glu Glu Glu His Asp Ile				
1285		1290	1295	
acg acg acg ttg gat gaa gtt gta gaa tta aaa gat gtc gaa gaa gac				3936
Thr Thr Thr Leu Asp Glu Val Val Glu Leu Lys Asp Val Glu Glu Asp				
1300		1305	1310	
aag atc gaa aaa gta tct gat tta aaa gat ctt gaa gaa gat ata tta				3984
Lys Ile Glu Lys Val Ser Asp Leu Lys Asp Leu Glu Glu Asp Ile Leu				
1315		1320	1325	
aaa gaa gta aaa gaa atc aaa gaa ctt gaa agt gaa att tta gaa gat				4032
Lys Glu Val Lys Glu Ile Lys Glu Leu Glu Ser Glu Ile Leu Glu Asp				
1330		1335	1340	
tat aaa gaa tta aaa act att gaa aca gat att tta gaa gag aaa aaa				4080
Tyr Lys Glu Leu Lys Thr Ile Glu Thr Asp Ile Leu Glu Glu Lys Lys				
1345		1350	1355	1360
gaa ata gaa aaa gat cat ttt gaa aaa ttc gaa gaa gaa gct gaa gaa				4128
Glu Ile Glu Lys Asp His Phe Glu Lys Phe Glu Glu Glu Ala Glu Glu				
1365		1370	1375	
ata aaa gat ctt gaa gca gat ata tta aaa gaa gta tct tca tta gaa				4176
Ile Lys Asp Leu Glu Ala Asp Ile Leu Lys Glu Val Ser Ser Leu Glu				
1380		1385	1390	

gtt gaa gaa gaa aaa aaa tta gaa gaa gta cac gaa tta aaa gaa gag Val [*] Glu Glu Glu Lys Lys Leu Glu Glu Val His Glu Leu Lys Glu Glu 1395 1400 1405	4224
gta gaa cat ata ata agt ggt gat gcg cat ata aaa ggt ttg gaa gaa Val Glu His Ile Ile Ser Gly Asp Ala His Ile Lys Gly Leu Glu Glu 1410 1415 1420	4272
gat gat tta gaa gaa gta gat gat tta aaa gga agt ata tta gac atg Asp Asp Leu Glu Glu Val Asp Asp Leu Lys Gly Ser Ile Leu Asp Met 1425 1430 1435 1440	4320
tta aag gga gat atg gaa tta ggg gat atg gat aag gaa agt tta gaa Leu Lys Gly Asp Met Glu Leu Gly Asp Met Asp Lys Glu Ser Leu Glu 1445 1450 1455	4368
gat gta aca aca aaa ctt gga gaa aga gtt gaa tcc tta aaa gat gtt Asp Val Thr Thr Lys Leu Gly Glu Arg Val Glu Ser Leu Lys Asp Val 1460 1465 1470	4416
tta tct agt gca tta ggc atg gat gaa gaa caa atg aaa aca aga aaa Leu Ser Ser Ala Leu Gly Met Asp Glu Glu Gln Met Lys Thr Arg Lys 1475 1480 1485	4464
aaa gct caa aga cct aag ttg gaa gaa gta tta tta aaa gaa gag gtt Lys Ala Gln Arg Pro Lys Leu Glu Glu Val Leu Leu Lys Glu Glu Val 1490 1495 1500	4512
aaa gaa gaa cca aag aaa aaa ata aca aaa aag aaa gta agg ttt gat Lys Glu Glu Pro Lys Lys Lys Ile Thr Lys Lys Lys Val Arg Phe Asp 1505 1510 1515 1520	4560
att aag gat aag gaa cca aaa gat gaa ata gta gaa gtt gaa atg aaa Ile Lys Asp Lys Glu Pro Lys Asp Glu Ile Val Glu Val Glu Met Lys 1525 1530 1535	4608
gat gaa gat ata gaa gaa gat gta gaa gaa gat ata gaa gaa gat ata Asp Glu Asp Ile Glu Glu Asp Val Glu Glu Asp Ile Glu Glu Asp Ile 1540 1545 1550	4656
gaa gaa gat aaa gtt gaa gat ata gat gaa gat ata gat gaa gat ata Glu Glu Asp Lys Val Glu Asp Ile Asp Glu Asp Ile Asp Glu Asp Ile 1555 1560 1565	4704
ggt gaa gac aaa gat gaa gtt ata gat tta ata gtc caa aaa gag aaa Gly Glu Asp Lys Asp Glu Val Ile Asp Leu Ile Val Gln Lys Glu Lys 1570 1575 1580	4752
cgc att gaa aag gtt aaa gcg aaa aag aaa aaa tta gaa aaa aaa gtt	4800

1780

1785

<210> 3
 <211> 1891
 <212> DNA
 <213> P. falciparum

<220>
 <221> CDS
 <222> (2)..(1891)

<400> 3

t aca tta act gaa agt gta gat gat aat aaa aat tta gaa gaa gcc gaa 49
 Thr Leu Thr Glu Ser Val Asp Asp Asn Lys Asn Leu Glu Glu Ala Glu
 1 5 10 15

gat ata aag gaa aat atc tta tta agt aat ata gaa gaa cca aaa gaa 97
 Asp Ile Lys Glu Asn Ile Leu Leu Ser Asn Ile Glu Glu Pro Lys Glu
 20 25 30

aat att att gac aat tta tta aat aat att gga caa aat tca gaa aaa 145
 Asn Ile Ile Asp Asn Leu Leu Asn Asn Ile Gly Gln Asn Ser Glu Lys
 35 40 45

caa gaa agt gta tca gaa aat gta caa gtc agt gat gaa ctt ttt aat 193
 Gln Glu Ser Val Ser Glu Asn Val Gln Val Ser Asp Glu Leu Phe Asn
 50 55 60

gaa tta tta aat agt gta gat gtt aat gga gaa gta aaa gaa aat att 241
 Glu Leu Leu Asn Ser Val Asp Val Asn Gly Glu Val Lys Glu Asn Ile
 65 70 75 80

ttg gag gaa agt caa gtt aat gac gat att ttt aat agt tta gta aaa 289
 Leu Glu Glu Ser Gln Val Asn Asp Asp Ile Phe Asn Ser Leu Val Lys
 85 90 95

agt gtt caa caa gaa caa caa cac aat gtt gaa gaa aaa gtt gaa gaa 337
 Ser Val Gln Gln Glu Gln Gln His Asn Val Glu Glu Lys Val Glu Glu
 100 105 110

agt gta gaa gaa aat gac gaa gaa agt gta gaa gaa aat gta gaa gaa 385
 Ser Val Glu Glu Asn Asp Glu Glu Ser Val Glu Glu Asn Val Glu Glu
 115 120 125

aat gta gaa gaa aat gac gac gga agt gta gcc tca agt gtt gaa gaa 433
 Asn Val Glu Glu Asn Asp Asp Gly Ser Val Ala Ser Ser Val Glu Glu
 130 135 140

agt	ata	gct	tca	agt	ggt	gat	gaa	agt	ata	gat	tca	agt	att	gaa	gaa	481
Ser	Ile	Ala	Ser	Ser	Val	Asp	Glu	Ser	Ile	Asp	Ser	Ser	Ile	Glu	Glu	
145					150				155					160		
aat	gta	gct	cca	act	ggt	gaa	gaa	atc	gta	gct	cca	act	ggt	gaa	gaa	529
Asn	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	
				165					170					175		
att	gta	gct	cca	agt	ggt	gta	gaa	agt	gtg	gct	cca	agt	ggt	gaa	gaa	577
Ile	Val	Ala	Pro	Ser	Val	Val	Glu	Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	
			180					185					190			
agt	gta	gct	cca	agt	ggt	gaa	gaa	agt	gta	gct	gaa	aat	ggt	gaa	gaa	625
Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	
		195				200						205				
agt	gta	gct	gaa	aat	ggt	gaa	gaa	atc	gta	gct	cca	agt	ggt	gaa	gaa	673
Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ile	Val	Ala	Pro	Ser	Val	Glu	Glu	
	210					215					220					
agt	gta	gct	gaa	aat	ggt	gaa	gaa	agt	gta	gct	gaa	aat	ggt	gaa	gaa	721
Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	
225					230					235				240		
agt	gta	gct	gaa	aat	ggt	gaa	gaa	agt	gta	gct	gaa	aat	ggt	gaa	gaa	769
Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	
				245					250					255		
agt	gta	gct	gaa	aat	ggt	gaa	gaa	atc	gta	gct	cca	act	ggt	gaa	gaa	817
Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	
			260					265					270			
agt	gta	gct	cca	act	ggt	gaa	gaa	att	gta	gct	cca	act	ggt	gaa	gaa	865
Ser	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	
		275				280						285				
agt	gta	gct	cca	act	ggt	gaa	gaa	att	gta	ggt	cca	agt	ggt	gaa	gaa	913
Ser	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Val	Pro	Ser	Val	Glu	Glu	
		290				295					300					
agt	gta	gct	cca	agt	ggt	gaa	gaa	agt	gta	gct	gaa	aat	ggt	gaa	gaa	961
Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	
305					310					315				320		
agt	gta	gct	gaa	aat	ggt	gaa	gaa	agt	gta	gct	gaa	aat	ggt	gaa	gaa	1009
Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	
				325					330					335		
agt	gta	gct	gaa	aat	ggt	gaa	gaa	agt	gta	gct	gaa	aat	ggt	gaa	gaa	1057

530

535

540

gta gaa att agc gga gaa agt tta gaa aac aat gaa atg gat aaa gca 1681
 Val Glu Ile Ser Gly Glu Ser Leu Glu Asn Asn Glu Met Asp Lys Ala
 545 550 555 560

ttt ttt agt gaa ata ttt gat aat gta aaa gga ata caa gaa aat tta 1729
 Phe Phe Ser Glu Ile Phe Asp Asn Val Lys Gly Ile Gln Glu Asn Leu
 565 570 575

tta aca ggt atg ttt cga agt ata gaa acc agt ata gta atc caa tca 1777
 Leu Thr Gly Met Phe Arg Ser Ile Glu Thr Ser Ile Val Ile Gln Ser
 580 585 590

gaa gaa aag gtt gat ttg aat gaa aat gtg gtt agt tcg att tta gat 1825
 Glu Glu Lys Val Asp Leu Asn Glu Asn Val Val Ser Ser Ile Leu Asp
 595 600 605

aat ata gaa aat atg aaa gaa ggt tta tta aat aaa tta gaa aat att 1873
 Asn Ile Glu Asn Met Lys Glu Gly Leu Leu Asn Lys Leu Glu Asn Ile
 610 615 620

tca agt act gaa ggc gaa 1891
 Ser Ser Thr Glu Gly Glu
 625 630

<210> 4

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

<400> 4

gtgatgaact ttttaatgaa ttattaaa

28

<210> 5

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

<400> 5

tggtgttctt gttgaacact ttttactaa

29

<210> 6
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Primer

<400> 6
 ggtatcgaaa ctgaggaaat aaagg

25

<210> 7
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Syntheticoligonucleotide

<400> 7
 catagcagga acatcaacat ccac

24

<210> 8
 <211> 1786
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Polypeptide

<400> 8
 Met Thr Asn Ser Asn Tyr Lys Ser Asn Asn Lys Thr Tyr Asn Glu Asn
 1 5 10 15

Asn Asn Glu Gln Ile Thr Thr Ile Phe Asn Arg Thr Asn Met Asn Pro
 20 25 30

Ile Lys Lys Cys His Met Arg Glu Lys Ile Asn Lys Tyr Phe Phe Leu
 35 40 45

Ile Lys Ile Leu Thr Cys Thr Ile Leu Ile Trp Ala Val Gln Tyr Asp
 50 55 60

Asn Asn Ser Asp Ile Asn Lys Ser Trp Lys Lys Asn Thr Tyr Val Asp
 65 70 75 80

Lys	Lys	Leu	Asn	Lys	Leu	Phe	Asn	Arg	Ser	Leu	Gly	Glu	Ser	Gln	Val	85	90	95
Asn	Gly	Glu	Leu	Ala	Ser	Glu	Glu	Val	Lys	Glu	Lys	Ile	Leu	Asp	Leu	100	105	110
Leu	Glu	Glu	Gly	Asn	Thr	Leu	Thr	Glu	Ser	Val	Asp	Asp	Asn	Lys	Asn	115	120	125
Leu	Glu	Glu	Ala	Glu	Asp	Ile	Lys	Glu	Asn	Ile	Leu	Leu	Ser	Asn	Ile	130	135	140
Glu	Glu	Pro	Lys	Glu	Asn	Ile	Ile	Asp	Asn	Leu	Leu	Asn	Asn	Ile	Gly	145	150	155
Gln	Asn	Ser	Glu	Lys	Gln	Glu	Ser	Val	Ser	Glu	Asn	Val	Gln	Val	Ser	165	170	175
Asp	Glu	Leu	Phe	Asn	Glu	Leu	Leu	Asn	Ser	Val	Asp	Val	Asn	Gly	Glu	180	185	190
Val	Lys	Glu	Asn	Ile	Leu	Glu	Glu	Ser	Gln	Val	Asn	Asp	Asp	Ile	Phe	195	200	205
Asn	Ser	Leu	Val	Lys	Ser	Val	Gln	Gln	Glu	Gln	Gln	His	Asn	Val	Glu	210	215	220
Glu	Lys	Val	Glu	Glu	Ser	Val	Glu	Glu	Asn	Asp	Glu	Glu	Ser	Val	Glu	225	230	235
Glu	Asn	Val	Glu	Glu	Asn	Val	Glu	Glu	Asn	Asp	Asp	Gly	Ser	Val	Ala	245	250	255
Ser	Ser	Val	Glu	Glu	Ser	Ile	Ala	Ser	Ser	Val	Asp	Glu	Ser	Ile	Asp	260	265	270
Ser	Ser	Ile	Glu	Glu	Asn	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	275	280	285
Pro	Ser	Val	Val	Glu	Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	Val	Glu	290	295	300
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	305	310	315
Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	325	330	335
Glu	Asn	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala			

340

345

350

Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Ser Val Ala
355 360 365

Pro Ser Val Glu Glu Ser Val Glu Glu Asn Val Glu Glu Ser Val Ala
370 375 380

Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
385 390 395 400

Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
405 410 415

Glu Asn Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile Val Ala
420 425 430

Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Ser Val Ala
435 440 445

Pro Ser Val Glu Glu Ser Val Glu Glu Asn Val Glu Glu Ser Val Ala
450 455 460

Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
465 470 475 480

Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
485 490 495

Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
500 505 510

Glu Asn Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile Val Ala
515 520 525

Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Ser Val Ala
530 535 540

Pro Ser Val Glu Glu Ser Val Glu Glu Asn Val Glu Glu Ser Val Ala
545 550 555 560

Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
565 570 575

Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ile Val Ala
580 585 590

Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile Val Ala
595 600 605

Pro Ser Val Val Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val Glu
 610 615 620
 Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
 625 630 635 640
 Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ile Val Ala
 645 650 655
 Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile Val Ala
 660 665 670
 Pro Ser Val Val Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val Glu
 675 680 685
 Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
 690 695 700
 Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
 705 710 715 720
 Glu Asn Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile Val Ala
 725 730 735
 Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Ser Val Ala
 740 745 750
 Pro Ser Val Glu Glu Ser Val Glu Glu Asn Val Glu Glu Ser Val Ala
 755 760 765
 Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala
 770 775 780
 Glu Asn Val Glu Glu Ser Val Ala Pro Thr Val Glu Glu Ile Val Ala
 785 790 795 800
 Pro Ser Val Glu Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val Ala
 805 810 815
 Glu Asn Val Ala Thr Asn Leu Ser Asp Asn Leu Leu Ser Asn Leu Leu
 820 825 830
 Gly Gly Ile Glu Thr Glu Glu Ile Lys Asp Ser Ile Leu Asn Glu Ile
 835 840 845
 Glu Glu Val Lys Glu Asn Val Val Thr Thr Ile Leu Glu Asn Val Glu
 850 855 860
 Glu Thr Thr Ala Glu Ser Val Thr Thr Phe Ser Asn Ile Leu Glu Glu

865		870		875		880									
Ile	Gln	Glu	Asn	Thr	Ile	Thr	Asn	Asp	Thr	Ile	Glu	Glu	Lys	Leu	Glu
				885					890					895	
Glu	Leu	His	Glu	Asn	Val	Leu	Ser	Ala	Ala	Leu	Glu	Asn	Thr	Gln	Ser
			900					905					910		
Glu	Glu	Glu	Lys	Lys	Glu	Val	Ile	Asp	Val	Ile	Glu	Glu	Val	Lys	Glu
		915					920					925			
Glu	Val	Ala	Thr	Thr	Leu	Ile	Glu	Thr	Val	Glu	Gln	Ala	Glu	Glu	Lys
	930					935					940				
Ser	Ala	Asn	Thr	Ile	Thr	Glu	Ile	Phe	Glu	Asn	Leu	Glu	Glu	Asn	Ala
945					950					955					960
Val	Glu	Ser	Asn	Glu	Asn	Val	Ala	Glu	Asn	Leu	Glu	Lys	Leu	Asn	Glu
				965					970					975	
Thr	Val	Phe	Asn	Thr	Val	Leu	Asp	Lys	Val	Glu	Glu	Thr	Val	Glu	Ile
			980					985					990		
Ser	Gly	Glu	Ser	Leu	Glu	Asn	Asn	Glu	Met	Asp	Lys	Ala	Phe	Phe	Ser
		995				1000					1005				
Glu	Ile	Phe	Asp	Asn	Val	Lys	Gly	Ile	Gln	Glu	Asn	Leu	Leu	Thr	Gly
1010						1015					1020				
Met	Phe	Arg	Ser	Ile	Glu	Thr	Ser	Ile	Val	Ile	Gln	Ser	Glu	Glu	Lys
1025				1030					1035					1040	
Val	Asp	Leu	Asn	Glu	Asn	Val	Val	Ser	Ser	Ile	Leu	Asp	Asn	Ile	Glu
			1045					1050					1055		
Asn	Met	Lys	Glu	Gly	Leu	Leu	Asn	Lys	Leu	Glu	Asn	Ile	Ser	Ser	Thr
		1060					1065					1070			
Glu	Gly	Val	Gln	Glu	Thr	Val	Thr	Glu	His	Val	Glu	Gln	Asn	Val	Tyr
	1075					1080					1085				
Val	Asp	Val	Asp	Val	Pro	Ala	Met	Lys	Asp	Gln	Phe	Leu	Gly	Ile	Leu
	1090				1095					1100					
Asn	Glu	Ala	Gly	Gly	Leu	Lys	Glu	Met	Phe	Phe	Asn	Leu	Glu	Asp	Val
1105				1110					1115					1120	
Phe	Lys	Ser	Glu	Ser	Asp	Val	Ile	Thr	Val	Glu	Glu	Ile	Lys	Asp	Glu
			1125				1130					1135			

Pro Val Gln Lys Glu Val Glu Lys Glu Thr Val Ser Ile Ile Glu Glu
1140 1145 1150

Met Glu Glu Asn Ile Val Asp Val Leu Glu Glu Glu Lys Glu Asp Leu
1155 1160 1165

Thr Asp Lys Met Ile Asp Ala Val Glu Glu Ser Ile Glu Ile Ser Ser
1170 1175 1180

Asp Ser Lys Glu Glu Thr Glu Ser Ile Lys Asp Lys Glu Lys Asp Val
1185 1190 1195 1200

Ser Leu Val Val Glu Glu Val Gln Asp Asn Asp Met Asp Glu Ser Val
1205 1210 1215

Glu Lys Val Leu Glu Leu Lys Asn Met Glu Glu Glu Leu Met Lys Asp
1220 1225 1230

Ala Val Glu Ile Asn Asp Ile Thr Ser Lys Leu Ile Glu Glu Thr Gln
1235 1240 1245

Glu Leu Asn Glu Val Glu Ala Asp Leu Ile Lys Asp Met Glu Lys Leu
1250 1255 1260

Lys Glu Leu Glu Lys Ala Leu Ser Glu Asp Ser Lys Glu Ile Ile Asp
1265 1270 1275 1280

Ala Lys Asp Asp Thr Leu Glu Lys Val Ile Glu Glu Glu His Asp Ile
1285 1290 1295

Thr Thr Thr Leu Asp Glu Val Val Glu Leu Lys Asp Val Glu Glu Asp
1300 1305 1310

Lys Ile Glu Lys Val Ser Asp Leu Lys Asp Leu Glu Glu Asp Ile Leu
1315 1320 1325

Lys Glu Val Lys Glu Ile Lys Glu Leu Glu Ser Glu Ile Leu Glu Asp
1330 1335 1340

Tyr Lys Glu Leu Lys Thr Ile Glu Thr Asp Ile Leu Glu Glu Lys Lys
1345 1350 1355 1360

Glu Ile Glu Lys Asp His Phe Glu Lys Phe Glu Glu Glu Ala Glu Glu
1365 1370 1375

Ile Lys Asp Leu Glu Ala Asp Ile Leu Lys Glu Val Ser Ser Leu Glu
1380 1385 1390

Val Glu Glu Glu Lys Lys Leu Glu Glu Val His Glu Leu Lys Glu Glu

1395

1400

1405

Val Glu His Ile Ile Ser Gly Asp Ala His Ile Lys Gly Leu Glu Glu
 1410 1415 1420

Asp Asp Leu Glu Glu Val Asp Asp Leu Lys Gly Ser Ile Leu Asp Met
 1425 1430 1435 1440

Leu Lys Gly Asp Met Glu Leu Gly Asp Met Asp Lys Glu Ser Leu Glu
 1445 1450 1455

Asp Val Thr Thr Lys Leu Gly Glu Arg Val Glu Ser Leu Lys Asp Val
 1460 1465 1470

Leu Ser Ser Ala Leu Gly Met Asp Glu Glu Gln Met Lys Thr Arg Lys
 1475 1480 1485

Lys Ala Gln Arg Pro Lys Leu Glu Glu Val Leu Leu Lys Glu Glu Val
 1490 1495 1500

Lys Glu Glu Pro Lys Lys Lys Ile Thr Lys Lys Lys Val Arg Phe Asp
 1505 1510 1515 1520

Ile Lys Asp Lys Glu Pro Lys Asp Glu Ile Val Glu Val Glu Met Lys
 1525 1530 1535

Asp Glu Asp Ile Glu Glu Asp Val Glu Glu Asp Ile Glu Glu Asp Ile
 1540 1545 1550

Glu Glu Asp Lys Val Glu Asp Ile Asp Glu Asp Ile Asp Glu Asp Ile
 1555 1560 1565

Gly Glu Asp Lys Asp Glu Val Ile Asp Leu Ile Val Gln Lys Glu Lys
 1570 1575 1580

Arg Ile Glu Lys Val Lys Ala Lys Lys Lys Lys Leu Glu Lys Lys Val
 1585 1590 1595 1600

Glu Glu Gly Val Ser Gly Leu Lys Lys His Val Asp Glu Val Met Lys
 1605 1610 1615

Tyr Val Gln Lys Ile Asp Lys Glu Val Asp Lys Glu Val Ser Lys Ala
 1620 1625 1630

Leu Glu Ser Lys Asn Asp Val Thr Asn Val Leu Lys Gln Asn Gln Asp
 1635 1640 1645

Phe Phe Ser Lys Val Lys Asn Phe Val Lys Lys Tyr Lys Val Phe Ala
 1650 1655 1660

Ala Pro Phe Ile Ser Ala Val Ala Ala Phe Ala Ser Tyr Val Val Gly
1665 1670 1675 1680

Phe Phe Thr Phe Ser Leu Phe Ser Ser Cys Val Thr Ile Ala Ser Ser
1685 1690 1695

Thr Tyr Leu Leu Ser Lys Val Asp Lys Thr Ile Asn Lys Asn Lys Glu
1700 1705 1710

Arg Pro Phe Tyr Ser Phe Val Phe Asp Ile Phe Lys Asn Leu Lys His
1715 1720 1725

Tyr Leu Gln Gln Met Lys Glu Lys Phe Ser Lys Glu Lys Asn Asn Asn
1730 1735 1740

Val Ile Glu Val Thr Asn Lys Ala Glu Lys Lys Gly Asn Val Gln Val
1745 1750 1755 1760

Thr Asn Lys Thr Glu Lys Thr Thr Lys Val Asp Lys Asn Asn Lys Val
1765 1770 1775

Pro Lys Lys Arg Arg Thr Gln Lys Ser Lys
1780 1785

<210> 9
<211> 630
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Polypeptide

<400> 9
Thr Leu Thr Glu Ser Val Asp Asp Asn Lys Asn Leu Glu Glu Ala Glu
1 5 10 15
Asp Ile Lys Glu Asn Ile Leu Leu Ser Asn Ile Glu Glu Pro Lys Glu
20 25 30
Asn Ile Ile Asp Asn Leu Leu Asn Asn Ile Gly Gln Asn Ser Glu Lys
35 40 45
Gln Glu Ser Val Ser Glu Asn Val Gln Val Ser Asp Glu Leu Phe Asn
50 55 60
Glu Leu Leu Asn Ser Val Asp Val Asn Gly Glu Val Lys Glu Asn Ile
65 70 75 80

Leu Glu Glu Ser Gln Val Asn Asp Asp Ile Phe Asn Ser Leu Val Lys
 85 90 95

Ser Val Gln Gln Glu Gln Gln His Asn Val Glu Glu Lys Val Glu Glu
 100 105 110

Ser Val Glu Glu Asn Asp Glu Glu Ser Val Glu Glu Asn Val Glu Glu
 115 120 125

Asn Val Glu Glu Asn Asp Asp Gly Ser Val Ala Ser Ser Val Glu Glu
 130 135 140

Ser Ile Ala Ser Ser Val Asp Glu Ser Ile Asp Ser Ser Ile Glu Glu
 145 150 155 160

Asn Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu
 165 170 175

Ile Val Ala Pro Ser Val Val Glu Ser Val Ala Pro Ser Val Glu Glu
 180 185 190

Ser Val Ala Pro Ser Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu
 195 200 205

Ser Val Ala Glu Asn Val Glu Glu Ile Val Ala Pro Ser Val Glu Glu
 210 215 220

Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu
 225 230 235 240

Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu
 245 250 255

Ser Val Ala Glu Asn Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu
 260 265 270

Ser Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu
 275 280 285

Ser Val Ala Pro Thr Val Glu Glu Ile Val Val Pro Ser Val Glu Glu
 290 295 300

Ser Val Ala Pro Ser Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu
 305 310 315 320

Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu
 325 330 335

Ser Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu

340

345

350

Ile	Val	Ala	Pro	Ser	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	
		355					360					365				
Ser	Val	Ala	Glu	Asn	Val	Ala	Thr	Asn	Leu	Ser	Asp	Asn	Leu	Leu	Ser	
		370				375					380					
Asn	Leu	Leu	Gly	Gly	Ile	Glu	Thr	Glu	Glu	Ile	Lys	Asp	Ser	Ile	Leu	
385					390					395					400	
Asn	Glu	Ile	Glu	Glu	Val	Lys	Glu	Asn	Val	Val	Thr	Thr	Ile	Leu	Glu	
				405					410					415		
Lys	Val	Glu	Glu	Thr	Thr	Ala	Glu	Ser	Val	Thr	Thr	Phe	Ser	Asn	Ile	
			420					425					430			
Leu	Glu	Glu	Ile	Gln	Glu	Asn	Thr	Ile	Thr	Asn	Asp	Thr	Ile	Glu	Glu	
		435					440					445				
Lys	Leu	Glu	Glu	Leu	His	Glu	Asn	Val	Leu	Ser	Ala	Ala	Leu	Glu	Asn	
450						455					460					
Thr	Gln	Ser	Glu	Glu	Glu	Lys	Lys	Glu	Val	Ile	Asp	Val	Ile	Glu	Glu	
465					470					475				480		
Val	Lys	Glu	Glu	Val	Ala	Thr	Thr	Leu	Ile	Glu	Thr	Val	Glu	Gln	Ala	
				485					490					495		
Glu	Glu	Glu	Ser	Glu	Ser	Thr	Ile	Thr	Glu	Ile	Phe	Glu	Asn	Leu	Glu	
			500					505					510			
Glu	Asn	Ala	Val	Glu	Ser	Asn	Glu	Lys	Val	Ala	Glu	Asn	Leu	Glu	Lys	
		515					520					525				
Leu	Asn	Glu	Thr	Val	Phe	Asn	Thr	Val	Leu	Asp	Lys	Val	Glu	Glu	Thr	
		530				535					540					
Val	Glu	Ile	Ser	Gly	Glu	Ser	Leu	Glu	Asn	Asn	Glu	Met	Asp	Lys	Ala	
545					550					555					560	
Phe	Phe	Ser	Glu	Ile	Phe	Asp	Asn	Val	Lys	Gly	Ile	Gln	Glu	Asn	Leu	
				565					570					575		
Leu	Thr	Gly	Met	Phe	Arg	Ser	Ile	Glu	Thr	Ser	Ile	Val	Ile	Gln	Ser	
			580					585					590			
Glu	Glu	Lys	Val	Asp	Leu	Asn	Glu	Asn	Val	Val	Ser	Ser	Ile	Leu	Asp	
		595					600					605				

Asn Ile Glu Asn Met Lys Glu Gly Leu Leu Asn Lys Leu Glu Asn Ile
 610 615 620

Ser Ser Thr Glu Gly Glu
 625 630

<210> 10
 <211> 50
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Polypeptide

<400> 10
 Arg Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly
 1 5 10 15
 Glu Val Lys Glu Asn Ile Leu Glu Glu Ser Gln Val Asn Asp Asp Ile
 20 25 30
 Phe Asn Ser Leu Val Lys Ser Val Gln Gln Glu Gln Gln His Asn Val
 35 40 45
 Glu Glu
 50

<210> 11
 <211> 100
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Polypeptide

<400> 11
 Val Glu Glu Ser Val Glu Glu Asn Asp Glu Glu Ser Val Glu Glu Asn
 1 5 10 15
 Val Glu Glu Asn Val Glu Asn Asn Asp Asp Gly Ser Val Ala Ser Ser
 20 25 30
 Val Glu Glu Ser Ile Ala Ser Ser Val Asp Glu Ser Ile Asp Ser Ser
 35 40 45
 Ile Glu Glu Asn Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Thr
 50 55 60

Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Lys Cys Ala Pro Ser
 65. 70 75 80

Val Glu Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val Ala Glu Met
 85 90 95

Leu Lys Glu Arg
 100

<210> 12
 <211> 47
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Polypeptide

<400> 12
 Arg Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly
 1 5 10 15
 Glu Val Lys Glu Asn Ile Leu Glu Glu Ser Gln Val Asn Asp Asp Ile
 20 25 30
 Phe Asn Ser Leu Val Lys Ser Val Gln Gln Glu Gln His Asn
 35 40 45

<210> 13
 <211> 26
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Polypeptide

<400> 13
 Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly Glu
 1 5 10 15

Val Lys Glu Asn Ile Leu Glu Glu Ser Gln
 20 25

<210> 14
 <211> 27
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 14

Leu Glu Glu Ser Gln Val Asn Asp Asp Ile Phe Ser Asn Ser Leu Val
1 5 10 15

Lys Ser Val Gln Gln Glu Gln Gln His Asn Val
20 25

<210> 15

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 15

Val Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val Ala Pro Ser Val
1 5 10 15

Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser Val
20 25

<210> 16

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 16

Leu Leu Ser Asn Ile Glu Glu Pro Lys Glu Asn Ile Ile Asp Asn Leu
1 5 10 15

Leu Asn Asn Ile
20

<210> 17

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Polypeptide

<400> 17

Val Glu Glu Ser

1

<210> 18

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Polypeptide

<400> 18

Val Glu Glu Asn

1

<210> 19

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Polypeptide

<400> 19

Val Glu Glu Ile

1

<210> 20

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Polypeptide

<400> 20

Val Ala Pro Ser

1

<210> 21

<211> 56

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 21

Val Glu Glu Lys Val Glu Glu Ser Val Glu Glu Asn Asp Glu Glu Ser
1 5 10 15

Val Glu Glu Asn Val Glu Glu Asn Val Glu Glu Asn Asp Asp Gly Ser
20 25 30

Val Ala Ser Ser Val Glu Glu Ser Ile Ala Ser Ser Val Asp Glu Ser
35 40 45

Ile Asp Ser Ser Ile Glu Glu Asn
50 55

<210> 22

<211> 540

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 22

Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Ser
1 5 10 15

Val Ala Pro Ser Val Glu Glu Ser Val Glu Glu Asn Val Glu Glu Ser
20 25 30

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
35 40 45

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ile
50 55 60

Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile
65 70 75 80

Val Ala Pro Ser Val Val Glu Ser Val Ala Pro Ser Val Glu Glu Ser
85 90 95

Val Glu Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
100 105 110

Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	115	120	125	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ile	130	135	140	
Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	145	150	155	160
Val	Ala	Pro	Ser	Val	Val	Glu	Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	165	170	175	
Val	Glu	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	180	185	190	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	195	200	205	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	210	215	220	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ile	225	230	235	240
Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	245	250	255	
Val	Ala	Pro	Ser	Val	Val	Glu	Ser	Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	260	265	270	
Val	Glu	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	275	280	285	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	290	295	300	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	305	310	315	320
Val	Ala	Pro	Thr	Val	Glu	Glu	Ile	Val	Ala	Pro	Ser	Val	Val	Glu	Ser	325	330	335	
Val	Ala	Pro	Ser	Val	Glu	Glu	Ser	Val	Glu	Glu	Asn	Val	Glu	Glu	Ser	340	345	350	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	Val	Ala	Glu	Asn	Val	Glu	Glu	Ser	355	360	365	
Val	Ala	Glu	Asn	Val	Glu	Glu	Ile	Val	Ala	Pro	Thr	Val	Glu	Glu	Ile				

370

375

380

Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Ser
385 390 395 400

Val Ala Pro Ser Val Glu Glu Ser Val Glu Glu Asn Val Glu Glu Ser
405 410 415

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
420 425 430

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ile
435 440 445

Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile
450 455 460

Val Ala Pro Ser Val Val Glu Ser Val Ala Pro Ser Val Glu Glu Ser
465 470 475 480

Val Glu Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
485 490 495

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
500 505 510

Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Glu Glu Ser
515 520 525

Val Ala Pro Ser Val Glu Glu Ser Val Ala Glu Asn
530 535 540

<210> 23

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 23

Asp Glu Asp Ile Glu Glu Asp Val Glu Glu Asp Ile Glu Glu Asp Ile
1 5 10 15

Glu Glu Asp Lys Val Glu Asp Ile Asp Glu Asp Ile Asp Glu Asp Ile
20 25 30

Gly Glu Asp Lys Asp Glu Val
35

<210> 24

<211> 56

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 24

Val Glu Glu Lys Val Glu Glu Ser Val Glu Glu Asn Asp Glu Glu Ser
1 5 10 15

Val Glu Glu Asn Val Glu Glu Asn Val Glu Glu Asn Asp Asp Gly Ser
20 25 30

Val Ala Ser Ser Val Glu Glu Ser Ile Ala Ser Ser Val Asp Glu Ser
35 40 45

Ile Asp Ser Ser Ile Glu Glu Asn
50 55

<210> 25

<211> 212

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 25

Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ile
1 5 10 15

Val Ala Pro Ser Val Val Glu Ser Val Ala Pro Ser Val Glu Glu Ser
20 25 30

Val Ala Pro Ser Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
35 40 45

Val Ala Glu Asn Val Glu Glu Ile Val Ala Pro Ser Val Glu Glu Ser
50 55 60

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
65 70 75 80

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
85 90 95

Val Ala Glu Asn Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ser
100 105 110

Val Ala Pro Thr Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ser
115 120 125

Val Ala Pro Thr Val Glu Glu Ile Val Val Pro Ser Val Glu Glu Ser
130 135 140

Val Ala Pro Ser Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
145 150 155 160

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ser
165 170 175

Val Ala Glu Asn Val Glu Glu Ser Val Ala Glu Asn Val Glu Glu Ile
180 185 190

Val Ala Pro Ser Val Glu Glu Ile Val Ala Pro Thr Val Glu Glu Ser
195 200 205

Val Ala Glu Asn
210

<210> 26

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Polypeptide

<400> 26

Val Val Glu Ser

1

<210> 27

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Polypeptide

<400> 27

Val Ala Glu Asn

1

<210> 28

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 28

Val Ala Pro Thr

<210> 29

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Polypeptide

<400> 19

Val Val Pro Ser

1